



UNIVERSITI PUTRA MALAYSIA

**TESTING MARKET INTEGRATION: AN ANALYSIS OF FRESH
SEA FISH PRICES IN JAVA**

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**TESTING MARKET INTEGRATION: AN ANALYSIS OF FRESH
SEA FISH PRICES IN JAVA**

by

Armen Zulham

A thesis submitted in partial fulfilment of the
requirements for the degree of Master of Science
in the Faculty of Economics and Management
Universiti Pertanian Malaysia

October, 1988



It is hereby certified that we have read this thesis entitled "Testing Market Integration: An Analysis of Fresh Sea Fish Prices in Java" by Armen Zulham, and in our opinion it is satisfactory in terms of scope, quality, and presentation as partial fulfilment of the requirements for the degree of Master of Science



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LIST OF ABBREVIATIONS

- P_{1t} : Price in Jakarta market
 P_{2t} : Price in Bandung market
 P_{3t} : Price in Semarang market
 P_{4t} : Price in Yogyakarta market
 P_{5t} : Price in Surabaya market

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October, 1988

Supervisor : Assoc. Prof. Mohammed bin Yusoff, Ph. D.

Faculty : Economics and Management

Two kinds of analyses were undertaken to study fresh sea fish commodity in Indonesia, namely, consumption of fresh sea fish in Indonesia and the pricing efficiency analysis of fresh sea fish in Java.

The data for consumption analysis were collected from Biro Pusat Statistik (BPS). A consumption equation was estimated and the adjustment coefficient was found to be 0.6186 suggesting that the adjustment to optimal consumption level was quite rapid. The results also suggest that in the short-run, the elasticities of demand with respect to price of fresh sea fish, income and price of substitute are -0.00035, 0.15379, and 0.00003 respectively, which were inelastic.



The long-run elasticities of demand with respect to price, income and price of substitute are -0.00056, 0.24861, and 0.00004, which were also inelastic.

The pricing efficiency analysis was based on three models, namely, correlation coefficient, regression, and causation models. These three models were analysed by using 65 months time series data. It was found that the correlation coefficient between Jakarta/Bandung, Jakarta/Semarang, Bandung/Semarang were at the moderate level and significant at 1 per cent confidence level, while the combinations of Jakarta/Yogyakarta, Bandung/ Yogyakarta, Bandung/Surabaya, Semarang/Yogyakarta, and Semarang/Surabaya were at a low level and significant at 5 per cent confidence level.

The correlation coefficient is not a good measure of pricing efficiency of a commodity. Thus, the regression model was used. It was hypothesized that the price of fresh sea fish in one market was influenced by the price of fresh sea fish in another market, the inflation rate, and fishing season. Generally, it was found that the price in one market influenced the price in the other market for the case of Jakarta, Bandung, Semarang, and Surabaya, which were significant at 5 per cent confidence level, but not for Yogyakarta. Except in one case of Bandung and Surabaya, the CPI was significant at 1 per cent level for all combinations of markets, while

the effect of fishing season on price was denoted by a dummy variable. It was found that for the main season, all the coefficients were negative and significant at 5 per cent level, except in the three cases of Jakarta, and one case of Yogyakarta. All the coefficients of the off-season were negative and significant at 5 per cent confidence level, except in the three cases of Jakarta, one case in Yogyakarta, and two cases of Surabaya.

The Sims causality test was employed to determine the direction of causation of the prices between any two markets. This analysis found that the transmission of information of price of Spanish Mackerel was bidirectional between Jakarta/Bandung, Jakarta/Semarang, Jakarta/Yogyakarta, Jakarta/Surabaya, Semarang/Jakarta, Semarang/Bandung, Semarang/Yogyakarta, Yogyakarta/Jakarta, Yogyakarta/Semarang, Yogyakarta/Surabaya, Surabaya/Jakarta, Surabaya/Semarang, and Surabaya/Yogyakarta. Yogyakarta and Surabaya experienced unidirectional relationship with Bandung.

Abstrak tesis yang dikemukakan kepada Senat Universiti
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untuk mendapatkan ijazah Master Sains

**UJIAN KETERPADUAN PASARAN: SUATU ANALISIS
HARGA IKAN LAUT SEGAR DI JAWA**

oleh

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Oktober, 1988

Penyelia : Prof. Madya Mohammed bin Yusoff, Ph. D.

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Dua jenis analisis telah dilakukan dalam kajian terhadap komoditi ikan laut segar di Indonesia, iaitu, penggunaan ikan laut segar di Indonesia dan analisis kecekapan harga ikan laut segar di Jawa.

Data untuk analisis penggunaan diperolehi dari Biro Pusat Statistik (BPS). Persamaan penggunaan setelah dianggar didapati bahawa koeffisien penyesuaian adalah 0.6186 yang menyatakan penyesuaian kepada penggunaan optimum adalah agak cepat. Adalah didapati juga bahawa dalam jangka pendek keanjalan permintaan terhadap harga ikan laut, pendapatan, dan harga barang gantian masing-masing ialah -0.00035, 0.15379,

dan 0.00003 yang mana semuanya tidak anjal. Dan dalam jangka panjang keanjalan permintaan terhadap harga ikan, pendapatan, dan harga barang gantian adalah -0.00056, 0.24861, dan 0.00004 yang mana semuanya juga tidak anjal.

Analisis kecekapan harga dianggap dengan menggunakan tiga model, iaitu, koefisien korelasi, regresi, dan model sebab musabab. Ketiga, model tersebut dianalisis dengan menggunakan 65 bulan data bulanan. Keputusan menunjukkan bahawa koefisien korelasi di antara Jakarta/Bandung, Jakarta/Semarang, Bandung/Semarang adalah pada paras sederhana dan bererti pada paras 1 peratus selang keyakinan; manakala koefisien dari kombinasi Jakarta/Yogyakarta, Bandung/Yogyakarta, Bandung/Surabaya, Semarang/Yogyakarta, dan Semarang/Surabaya adalah rendah dan bererti pada paras 5 peratus.

Koefisien korelasi bukanlah cara yang terbaik untuk mengukur kecekapan harga daripada suatu komoditi. Dengan itu model regresi digunakan. Adalah dihipotesiskan bahawa harga ikan di suatu pasaran adalah dipengaruhi oleh harga ikan dari pasaran yang lain, tingkat inflasi, dan musim ikan. Pada amnya, keputusan menunjukkan bahawa harga di sebuah pasaran dipengaruhi oleh harga daripada pasaran lain untuk kes-kes Jakarta, Bandung, Semarang, dan Surabaya di mana ianya bererti pada paras 5 peratus, tetapi ianya tidak bererti bagi Yogyakarta. Kecuali satu kes dari Bandung dan Surabaya, semua

kombinasi menunjukkan bahawa indeks harga pengguna adalah bererti pada paras 1 peratus. Pembolehubah dumi menunjukkan kesan musim ikan terhadap harga. Adalah didapati bahawa kesemua koefisien musim ikan adalah negatif dan bererti pada paras 5 peratus, kecuali dalam 3 kes dari Jakarta, dan satu kes dari Yogyakarta. Pada masa bukan musim ikan semua koefisien juga adalah negatif dan bererti pada paras 5 peratus, kecuali tiga kes dari Jakarta, satu kes dari Yogyakarta, dan dua kes dari Surabaya.

Ujian sebab musabab Sims digunakan untuk menentukan arah pengaruh harga antara dua pasaran. Kajian ini menunjukkan bahawa aliran maklumat harga ikan tenggiri adalah dua hala antara Jakarta/Bandung, Jakarta/Semarang, Jakarta/Yogyakarta, Jakarta/Surabaya, Semarang/Jakarta, Semarang/Bandung, Semarang/Yogyakarta, Yogyakarta/Jakarta, Yogyakarta/Semarang, Yogyakarta/Surabaya, Surabaya/Jakarta, Surabaya/Semarang, and Surabaya/Yogyakarta; manakala Yogyakarta dan Surabaya mempunyai hubungan satu hala dengan Bandung.

CHAPTER I

INTRODUCTION

General Background

Indonesia is a highly diverse country spread across an archipelago of 13,677 islands, with a land area of 2.7 million square kilometers (Bailey et al., 1985). The population is over 165 million of which 60.72 per cent live in Java (Biro Pusat Statistik, 1985). Indonesia is the world's fifth most populous nation, and its population is growing at the rate of 2.21 per cent per annum.

The country has a highly diversified resource base, with plentiful primary energy resources, significant mineral deposits, large timber resources and a developed system of agricultural commodity production and export. A high proportion of these primary resources are located on the sparsely populated islands of Sumatra, Kalimantan and Irian Jaya; while two-thirds of the population are concentrated on the inner islands of Java, Bali and Madura, which account for no more than seven per cent of Indonesia's land resources. The land use in the inner islands is reaching, while in many area is exceeding, the ecologically safe limits. The cultivable

land resources in Sumatra, Kalimantan, Sulawesi and Irian Jaya, which amount to as much as 40 million hectares, have remained underutilized.

Another important resource is the marine resources, which are enclosed within a 200-mile Exclusive Economic Zone (EEZ), and which can be used to support the Indonesian economy.

According to Biro Pusat Statistik (1986), Indonesia's Gross Domestic Product (GDP) is supported by two important sectors, namely, mining and quarrying (especially petroleum and natural gas, accounting for 17.9 per cent) and agriculture (accounting for 24 per cent). During this period the contribution of the fisheries sector to agriculture Gross Domestic Product was 6.8 per cent.

Although the fishery sector's contribution is not substantial, it provides an important source of income for fishermen and traders. It also provides an important source of protein in the Indonesians' diet, and foreign exchange. The fishery sector employs directly about three million fishermen and aquaculture workers (Direktorat Jenderal Perikanan, 1987), and provides substantial employment for the people who are involved in processing, handling, transport and marketing of fish.

Production and Utilization of Fish

The production of marine fisheries has been increasing every year. The marine fisheries is more important than inland fisheries in terms of its contribution to domestic supply and export (Table 1.1).

The pattern of fish utilization has changed in recent years. The consumption of fresh fish has increased from 42 per cent in 1974 to 48 per cent in 1985 while that of cured fish has decreased from 50 per cent in 1974 to 35 per cent in 1985. Most of frozen fish products are exported. The production of marine fisheries has been on the rising trend and therefore, it is expected that the production of fresh fish will increase in the future. Live fish distribution has shown a marked increase due to better handling and communication facilities (Ilyas, 1976).

The figure projected by Biro Pusat Statistik (1985) shows that 60.72 per cent of Indonesia's population live on the relatively small island of Java, while the island's annual fish production is only 28.7 per cent of Indonesia's total fish catches (Direktorate Jenderal Perikanan, 1987). Theoretically, there should be substantial demand for fish products in Java, but this is not quite true due to the relatively low purchasing power of the majority of the people, except those who are

Table 1.2
Disposition of percentage total catch
in Indonesia, 1974 and 1985

Catagory	1974 ^a	1985 ^b
Fresh: mostly for domestic use	42.000	48.000
Frozen: mainly for export	3.100	3.200
Cured: mainly dry salted	50.000	35.000
Canned: oil sardine and milkfish	1.000	0.004
Reduction for poultry and fish feed	3.900	na
Offal and miscellenous	very slight	0.010

Source: ^a Ilyas, 1976.

^b Direktorat Jenderal Perikanan, 1987.

na : not available.